

10 June 2002
C6-BRC-L-02-016

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Attention: John Geroch

Subject: **GENERAL WASTE DISCHARGE REQUIREMENTS PERMIT
APPLICATION FOR CARBOHYDRATE SOLUTION ADDITION,
BOEING REALTY CORPORATION, FORMER C-6 FACILITY,
19503 SOUTH NORMANDIE AVENUE, LOS ANGELES, CA**

Dear Mr. Geroch:

ARCADIS G&M, Inc. (ARCADIS) has prepared this General Waste Discharge Requirements (WDR) permit application package for Boeing Realty Corporation (BRC) for the former Boeing C-6 Facility (Site) located at 19503 South Normandie Avenue, Los Angeles, California. BRC is submitting this WDR application to the Los Angeles Regional Water Quality Control Board (LARWQCB) to allow for the addition of a food-grade carbohydrate solution (molasses) to enhance the biodegradation of chlorinated volatile organic compounds (cVOCs) present in Parcel C groundwater in accordance with our pilot test Workplan dated August 15, 2001 and approved by the LARWQCB on May 17, 2002.

An in-situ reactive zone (IRZ) pilot test will be conducted within the cVOC-impacted source area (former Building 2 area) to determine the efficacy of the technology. In the event that the pilot test will be expanded, then a Workplan addendum will be prepared for LARWQCB review and approval, and a modification to the monitoring and reporting program for the WDR permit will be approved by the LARWQCB. The review and approval process for the WDR monitoring and reporting program will be streamlined as the initial WDR permit application will have been through the LARWQCB legal review and public comment as required by the California Environmental Quality Act (CEQA), thereby meeting this requirement.

This permit package is submitted to include the required information set forth under Item C.1.b of the General WDR permit for new applicants. A summary of the required information (underlined) is listed below.

1. The discharger must have an approved plan. A plan, *Building 2 In-Situ Reactive Zone Pilot Test Workplan*, was submitted to the LARWQCB for review on August 15, 2001. The plan was approved by the LARWQCB in a letter dated May 17, 2002. The Workplan and the approval letter are included in Attachments A and B, respectively.





2. The background water quality of the aquifer of the groundwater remediation site(s) including contaminant types, total dissolved solids, sulfates, chlorides, nitrogen (NH₄, NO₃, NO₂), chemical oxygen demand, biological oxygen demand, phosphorus, pH, nutrients, dissolved oxygen, dissolved carbon dioxide, methane, temperature, iron, oxygen reduction potential, and hydraulic conductivity. The analytical results for these parameters are included in Attachment C. The estimated hydraulic conductivity is between 10 and 20 feet per year.
3. Information on any potential adverse impacts to groundwater quality, and whether the impacts will be localized and short-term. The overall groundwater quality is expected to be improved due to the reduction of cVOCs. The total organic carbon (TOC) is expected to increase with the addition of food-grade carbohydrate solution (molasses). Also, during the initial stages of injection, the measured levels of cVOCs are also expected to temporarily increase due to biological surfactant effect resulting from the increased microbial activity. Once a more reducing environment is established, the cVOCs and its byproducts will decline. The end products of the biodegradation of cVOCs will be carbon dioxide and water. The areas impacted will be primarily localized to the locations where carbohydrate solution will be added. The duration of impact will be temporary since the half-life of carbohydrate solution is on the order of a few days.
4. The results of any pilot testing performed for the treatment technology to be used. Six case studies using the IRZ technology are included in Attachment D.
5. Site-specific geology (lithology and physical parameters) and hydrogeological parameters, hydrologic report. The geology and hydrogeology is discussed in Section 1.1 of the Workplan.
6. Infiltration rate. The infiltration rate will be dependant on the geology. The estimated infiltration rate is between 5 and 15 gallons per minute.
7. Characterization and extent of volatile organic compound plume. The characterization and extent of cVOCs impact is discussed in Section 1.1 of the Workplan. A more detail description could be found in a document titled Annual Groundwater Monitoring Report-January/February 2001 dated June 20, 2001.
8. Description of the treatment system. A description of the IRZ system pilot test is discussed in Section 3.0 of the Workplan.
9. Adequate groundwater monitoring network with historic groundwater monitoring report. The monitoring well network, including sampling and parameter schedule, is discussed in Section 3.2.4 of the Workplan. Historic groundwater monitoring data could be found in the latest groundwater monitoring report dated October 2001.
10. Description of the areal extent of the application area and identification of monitoring wells to be used to determine water quality upgradient, within the application area, downgradient from the application area and identify the compliance point. The areal extent of the application area is discussed in Section 3.2.2 of the Workplan. The monitoring well network, including the upgradient, within the application area, and downgradient, is discussed in Section 3.2.4 of the Workplan. Well TMW-12, located

approximately 400 feet from downgradient edge of the application area, will be used as the compliance point.

11. MSDS information and other product technical information for any materials to be used for cleanup. MSDS sheets for amendments to the groundwater are included in Attachment E.

12. Application rate, material type(s) and applied concentrations. The application rate will be based on the groundwater monitoring data after the initial amendment event. The materials added into the groundwater include molasses solution, sodium bicarbonate, and potassium bromide. The applied concentration is approximately 13 percent molasses to water solution. This is also discussed in Section 3.2.1 of the Workplan.

13. Evaluate loading rates for nitrogen compounds, total dissolved solids, sulfate, and chloride compounds. There will be no loading of these compounds. Organic solution (i.e. molasses solution) will be added.

The WDR application Form 200 is included in Attachment F. Also included is a check made out to the LARWQCB for \$1,700. This check is for the balance of the \$2,000 total permit fee minus the \$300 that was previously sent to the LARWQCB on October 2, 2001. A copy of this \$300 (check #20509) is included for your reference.

We would appreciate any efforts in expediting the review and approval process. If you have any questions or comments, or if you require additional information, please do not hesitate to contact the undersigned or Mr. James K. Nguyen at (714) 278-0992.

Sincerely,



Mario Stavale
Boeing Realty Corporation

Attachments:

- A - Building 2 *In-Situ* Reactive Zone Pilot Test Workplan
- B - LARWQCB Workplan Approval Letter
- C - Analytical Results
- D - IRZ Case Histories and Enhanced In Situ Bioremediation Literatures
- E - Material Safety Data Sheets
- F - Form 200, Application of Waste Discharge General Information Form (includes permit fee of \$1,700)

Cc: Brian Mossman, Boeing Realty Corporation

